Castilleja

The Newsletter of the Wyoming Native Plant Society

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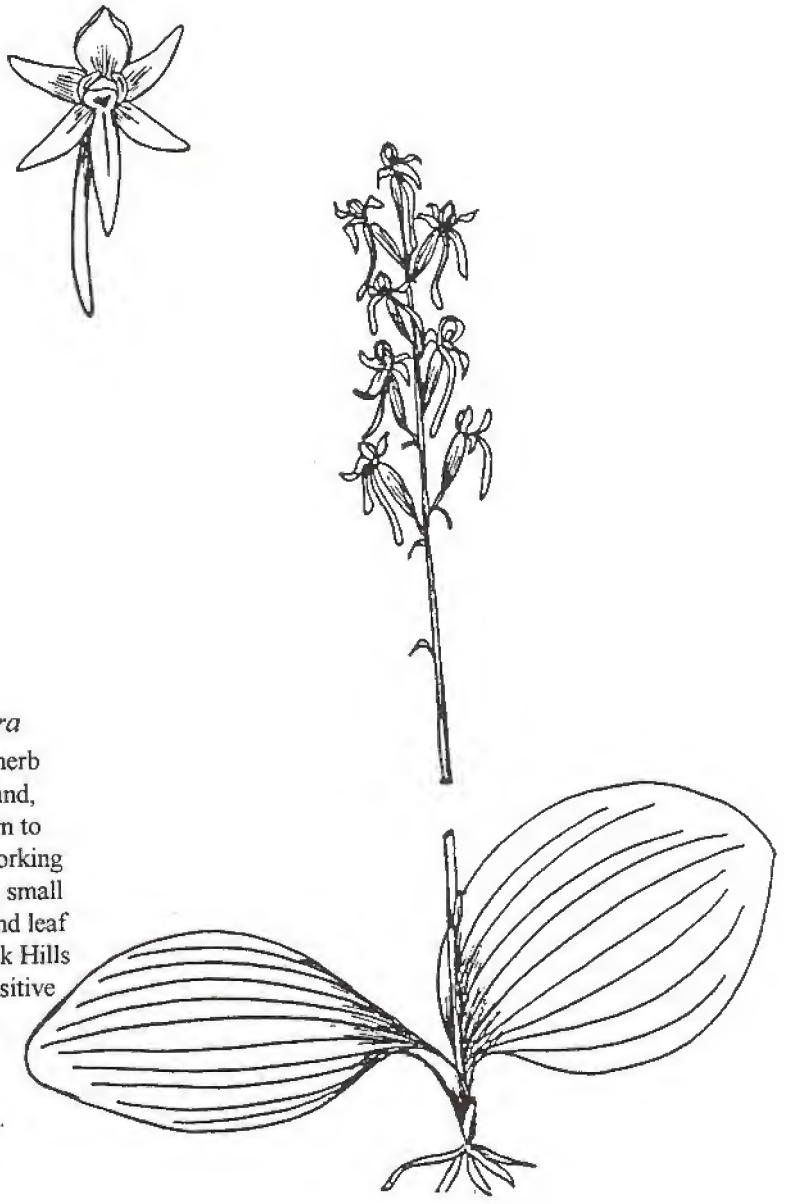

Large Round Leaf Orchid (*Platanthera orbiculata)* is a whitish-green flowered perennial herb recognized by its pair of large, elliptic to nearly round, basal leaves. This species was not previously known to occur in Wyoming until Ted Toombs, a botanist working for the Black Hills National Forest, discovered two small colonies in Crook County in July 1997. Large round leaf orchid is known from fewer than 5 sites in the Black Hills of Wyoming and South Dakota and is listed as Sensitive by the US Forest Service. It is restricted to shady, north-facing paper birch, hazelnut, and spruce forests, a habitat it shares with many other rare plants of the Black Hills. Illustration by W. Fertig.

WNPS NEWS

1998 Student Scholarship: The WNPS Board is pleased to award the 1998 student scholarship to Amy Roderick, a graduate student in the Botany Department of the University of Wyoming. Amy is conducting a floristic and rare plant study in the North Platte River drainage and Shirley Basin area of central Wyoming under the direction of Dr. Ron Hartman. The Board awarded Amy $500.00, the largest prize in the history of the scholarship program. Thanks are extended to all WNPS members who contributed to the scholarship program in the past year.

Summer Field Trips: This summer's annual meeting/field trip is scheduled for the weekend of August 1-2 in the Green River Lakes country of the western Wind River Range. Our itinerary will include stops at Kendall Warm Springs, the Green River Lake fen, and a 4-8 mile hike on the lakeside trail. A second field trip is planned for the Ferris Mountains on Saturday, 20 June, 1998. We will explore the foothills and upper slopes of this familiar landmark by Muddy Gap, and if time permits, visit nearby sand dune communities. A short Sunday trip is also planned to the Beaver Rim area to see desert yellowhead (*Yermo xanthocephalus*) and other rarities. Look for more details on these (and possibly other field trips) in the May newsletter.

New Native Plant Society in Great Plains: A new organization, the Great Plains Native Plant Society, has recently been formed to promote scientific research, disseminate knowledge, and increase public familiarity with the flora of the Great Plains. In conjunction with the High Plains Heritage Center Museum, the society will be establishing a botanic garden near Spearfish this spring. In addition, the society produces a newsletter, "Plains Plants". For more information, contact the Great Plains Native Plant Society, PO Box 461, Hot Springs, South Dakota 57747.

Election Time: A slate of candidates for the WNPS Board will appear on the ballot/renewal notice in the May newsletter. It is not too late to nominate someone (perhaps yourself?) for one of these jobs!

New Members: Please welcome the following new members of WNPS: Deborah Kurtz (Bozeman, MT), Faye Streier (Spearfish, South Dakota), and Paula Wolfe (Laramie).

We're looking for new members: Do you know someone who would be interested in joining WNPS? Send their name or encourage them to contact the Society for a complimentary newsletter.

Attention Readers: We are always looking for articles and illustrations for the newsletter. Items for the May issue are needed by 30 April 1998.

Treasurer's Report: Balance as of 10 March 1998: General Fund $434.21; 1998-99 Student Scholarship Fund $230.00; Total funds: 664.21 WF

Wyoming Native Plant Society
1604 Grand Ave., Laramie, WY 82070

President: Charmaine Refsdal Delmatier (Green River)
Vice President: Dick Scott (Riverton)
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Contributors to this issue: Bruce Barnes (BB), John Baxter, Walter Fertig (WF), and Hollis Marriott.

US Fish and Wildlife Service Proposes Listing Colorado Butterfly Plant as Threatened

On March 24, 1998, the US Fish and Wildlife Service published a proposal in the Federal Register to list the Colorado butterfly plant (*Gaura neomexicana* ssp. *coloradensis*) as Threatened under the Endangered Species Act. The Service is actively soliciting new information about the status, threats, and ongoing conservation activities for this species during a public comment period on the proposed listing, which ends May 26, 1998. This information will be considered in making the final listing determination, which must be made by March 24, 1999.

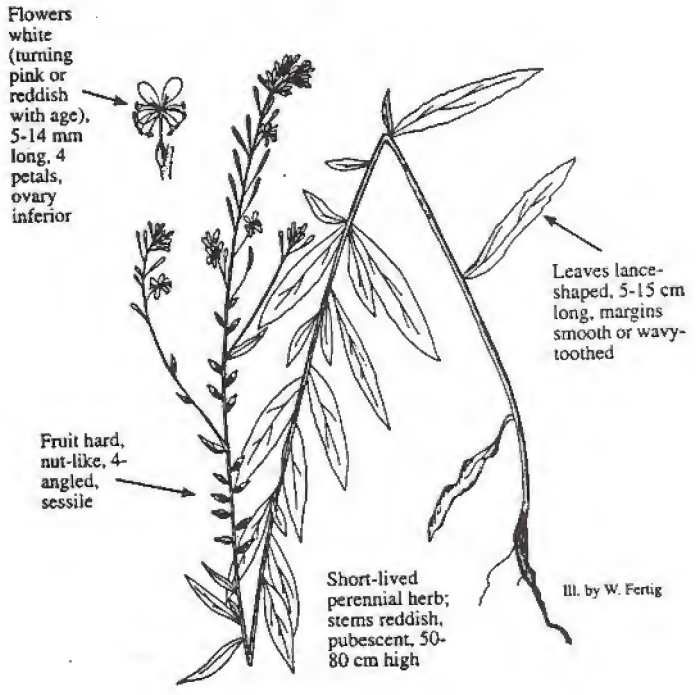
The following species "fact sheet" (pages 3-4) has been developed to provide information on the identification, habitat, and management needs of this species.

Colorado butterfly plant
Gaura neomexicana ssp. coloradensis
Fact Sheet

Status: The Colorado butterfly plant is currently a candidate for listing as Threatened under the Endangered Species Act. The species is known from less than 25 locations worldwide, all within a small area in Laramie County, Wyoming and adjacent parts of SW Nebraska and NE Colorado. Census information from 1986-1993 indicates that the total global population may be as low as 35,000 plants. With the exception of 2 large populations on F.E. Warren Air Force Base, all known occurrences are on private lands.

Description: The Colorado butterfly plant is a short-lived perennial herb with one to several reddish, hairy stems 1-3 feet tall. The lance-shaped leaves average 2-4 inches long and have smooth or wavy-toothed edges. Flowers are arranged in a branched, elongate stalk at the tip of the stem. Only a few flowers are open at any time and these are located below the rounded buds and above the mature fruits. Individual flowers are 3/8 inches long with 4 reddish sepals and 4 white petals that turn pink or red with age. The hard, nut-like fruits are 4-angled and stalkless. Non-flowering plants consist of a ground-hugging rosette of oblong, hairless leaves 1 ½- 8 inches long.

Look-alikes: Small-flowered butterfly plant (*Gaura parviflora*) is a widespread, somewhat weedy annual of upland sites with white flowers less than 1/8 inches long. Scarlet gaura (*Gaura coccinea*) is a low, bushy perennial with leaves less than 1 ¼ inches long. Rosettes of Flodman's thistle (*Cirsium flodmanii*) and evening primrose (*Oenothera* spp.) are more notably hairy.



Above: Colorado butterfly plant (*Gaura neomexicana ssp. coloradensis*).

Flowering Period: Flowering occurs from mid July to mid September (or until the first major frost). Fruits are produced from late July until the first frost.

Habitat: Colorado butterfly plant occurs on subirrigated, alluvial soils on level or slightly sloping floodplains and drainage bottoms. Colonies are most often found in low depressions or along bends in wide, meandering streambeds a short distance

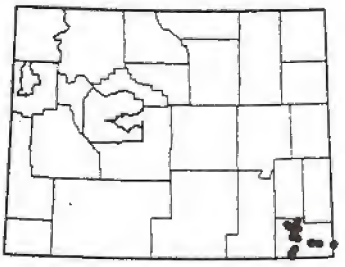
upslope of the actual channel. It is commonly associated with redtop (*Agrostis stolonifera*) and Kentucky bluegrass (*Poa pratensis*) on wetter sites and wild licorice (*Glycyrrhiza lepidota*), Flodman's thistle (*Cirsium flodmanii*), and smooth scouring rush (*Equisetum laevigatum*) on drier sites. Colonies on Warren Air Force Base are somewhat unusual in that they may occur in areas with dense shrub and grass cover.

Management Needs: Colorado butterfly plant is adapted to colonize riparian sites that are periodically disturbed, especially by flooding. In the absence of occasional disturbance, the plants' habitat can become choked out by dense growth of willows and grasses. Competition from exotic weeds, such as Canada thistle (*Cirsium arvense*) and leafy spurge (*Euphorbia esula*), can be a serious threat in some areas of butterfly plant habitat. Broadleaf herbicides have also been implicated as a threat to this species.

Long-term studies have shown that Colorado butterfly plant may persist and thrive in habitats that are winter grazed by livestock or managed on a short-term rotation cycle. Although the butterfly plant itself may be grazed (it appears to be quite palatable to a wide range of herbivores), the reduction of competing vegetative cover allows seedlings to become more readily established.

Mowing of Colorado butterfly plant habitat for hay has also been suggested as a potential threat to the species. In many situations, this threat can be mitigated if the haying is delayed until late in the plant's growing season (after the fruits have ripened). Due to the hard fruit wall, the seeds are not damaged by cutting and may actually be dispersed in the process. Likewise, early season mowing (before the flower stalks have bolted) may be advantageous to the plant by reducing the cover of competing vegetation.

Conservation Needs: The Colorado butterfly plant is being considered for listing under the Endangered Species Act due to its small global range and population size, moderate degree of threat, and current lack of adequate protection. The key to conservation of this species is continuing management practices on private agricultural lands that are compatible with the plant's needs.



Above: Range of Colorado butterfly plant in SE Wyoming.

Prepared by Walter Fertig, botanist, Wyoming Natural Diversity Database, 1604 Grand Ave., Laramie, WY, 82070.

Botanist's Bookshelf

By Hollis Marriott

Several years ago, I received as gifts two books from two friends, neither of whom knew the other. No sooner had I finished the first book when the second arrived, and I eagerly read it as a sequel. I highly recommend both to readers who love the natural history of the western United States, and who at times wish that they too could have lived in the exciting era of the nineteenth-century naturalists.

Pioneer Naturalists: The Discovery and Naming of North American Plants and Animals, by Howard Ensign Evans. New York: Henry Holt and Co. 1993.

Evans' book is a collection of stories about the early North American naturalists, and about the creatures that were named after them. It begins with an Introduction describing the study of natural history in North America from the first days of discovery, including the impact of the Linnaean revolution in classification. To European naturalists, North America offered vast unexplored territory, with discoveries of new species almost guaranteed. This same irresistible lure later drew American naturalists westward, into the Rockies and beyond. The collection of characters is fascinating. Some were educated, some were self-trained, some were politicians, some were independently wealthy, and many were eccentric (are we surprised?).

Evans presents the pioneer naturalists through their discoveries and namesakes. He starts with Abbot's' Sphinx (for John Abbot) and finishes with *Zenaida* (for Zenaida Bonaparte). En route are Agassiz's turtles (Louis Agassiz), Comstock's mealybug (John Henry Comstock), Douglas-fir (David Douglas), Drummond's mosses (Thomas Drummond), *Muhlenbergia* (Gotthilf Heinrich Ernst Muhlenberg), Ord's kangaroo rat (George Ord), Ross' goose (Bernhard Rogan Ross), Tuckerman's lichens (Edward Tuckerman), Underwood's ferns (Lucien Marcus Underwood), Yarrow's scaly lizard (Henry Crecy Yarrow) and 65 other portraits. In most, Evans tells of both the scientist that named the taxon and the individual honored by the name. Plants are well represented: *Clarkia, Claytonia, Eschscholzia, Menziesia, Rudbeckia,* Nelson's larkspur (is that Ernie Nelson?), Engelmann spruce, and Queen Anne's lace are some examples.

These crazy characters and their namesakes are interesting subjects in their own right, but Evans' accounts make them even more memorable. I found the stories very readable, very entertaining. Evans' appreciation of the natural world comes through clearly in his writing.

The book finishes with chapters on *Women in Natural History* and *Naturalists Then and Now*. It is enlightening to read these essays and ask oneself, "Could I have been a nineteenth century naturalist?"

A wildflower by any other Name: Sketches of pioneer naturalists who named our western plants, by Karen B. Nilsson. Yosemite National Park, CA. Yosemite Association. 1994.

Karen Nilsson was a very active botanist, naturalist, and environmentalist in the California Bay Area until her death in 1991. This book was her last publishing project – the nearly completed manuscript was finished by her husband and friends. Here and there are words that describe her infectious enthusiasm for field botany – in the *Foreword*, in *About the Author* and in the review on the back cover. But it is her first sentences that are convincing: "As you bend down to appreciate the beauty of a Lemmon's Paintbrush or to smile at the "mouse-tail" bracts emanating from a Douglas-fir cone, you are on the threshold of fascinating history. If only these tiny bits of nature could tell their own stories."

Nilsson's biographies are arranged in chronological order, beginning with Meriwether Lewis and William Clark, and ending with that pillar of Sierra Nevada history, Carl Sharsmith. She includes much original material – quotes from the individuals and their colleagues, excerpts from the naturalists' journals and from those of their traveling companions. There are detailed accounts of collecting, and of the demands of travelling and camping in the nineteenth century West, all quite fascinating for a modern-day field botanist.

Nilsson was especially interested in endangered plants and in female botanists, and both topics are addressed in this book. Several of the naturalists were chosen by Nilsson because of their work in describing and conserving rare species. Eight women are included – some were wives of prominent botanists, but most became prominent on their own in spite of numerous obstacles.

The book includes cartoons and beautiful illustrations of plants by Andrea Hendrick, and paintings and photographs of the naturalists. My favorite is a photo of Alice Eastwood, plant press in her lap, sitting next to her car, Lucy. I hope I will be doing the same when my hair is white.

What Happened to *Carex rostrata?*

By Walter Fertig

Beaked sedge (*Carex rostrata*) is one of the most abundant, widespread, and ecologically important sedge species in Wyoming, ranging from basin marshes to subalpine streamsides. Trouble is, it probably does not occur in the state!

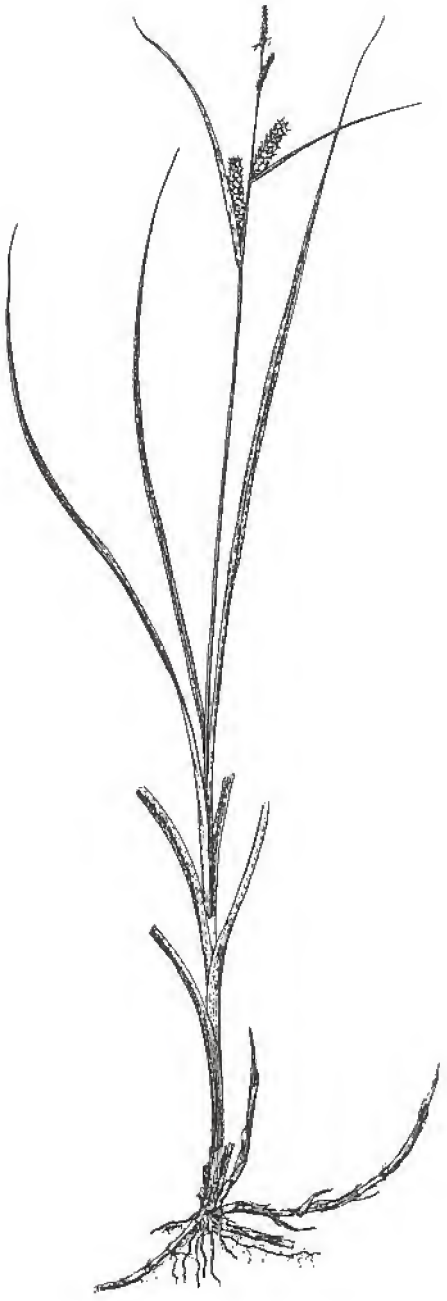
Recent taxonomic studies by Dr. Tony Reznicek of the University of Michigan have challenged the traditional interpretation of this species in western North American floras. After more than a decade of field and herbarium studies, Dr. Reznicek has uncovered compelling evidence that there are actually two species of beaked sedge in North America, "true" *Carex rostrata* and a previously unrecognized species called *Carex utriculata*. Although superficially similar, the two sedges consistently differ in leaf morphology, habitat, and geographic distribution. Of the two, *C. utriculata* is actually the more common.

The main difference between these species is in the color, shape, and texture of their leaves. "True" *Carex rostrata* has a heavy wax layer on the epidermis, giving the leaves a bluish-green (glaucous) color. In contrast, *C. utriculata* has pale yellow-green to dark olive-green leaves and lacks the waxy layer. The leaf blades of *C. rostrata* are usually less than 4.5 mm wide and U-shaped in cross-section, while the blades of *C. utriculata* are often 5-12 mm wide and V-shaped in cross section due to folding of the keeled midrib. Lastly, the upper leaf surface of *C. rostrata* is covered by small, rounded bumps (papillae), while the surface of *C. utriculata* leaves are smooth or have scattered prickle-like hairs. The leaf surface characters show up quite nicely on scanning electron microscope images, but can also be observed under a good dissecting microscope!

Carex utriculata is by far the more widespread of the two species in North America, occurring from Alaska to Newfoundland and south to southern California, northern New Mexico, and Virginia. It is found in a wide variety of habitats, including wet meadows, springs, bogs, streamsides, and even roadside ditches. *C. rostrata*, by contrast, is primarily a northern Eurasian and Trans-Canadian species that is restricted to floating mats in shallow-water fens.

To date, all of the beaked sedge material studied in Wyoming appears to belong to *Carex utriculata* rather than *C. rostrata*. The nearest bona fide populations of "true" *Carex rostrata* are found in northwestern Montana. Potential *C. rostrata* habitat may occur in the fen wetland areas of northwestern Wyoming. Careful study may show that Wyoming has *Carex rostrata* after all!!

For more information:
Reznicek, A.A. 1985. What is *Carex rostrata* Stokes? Am. J. Bot. 72:966.
Reznicek, A.A. 1997. The true *Carex rostrata* in the American Rockies. Sage Notes [newsletter of the Idaho Native Plant Society] 19(4): 11-13.



Above: *Carex utriculata*, the common "beaked sedge" of the Rocky Mountains. Illustration from Hermann (1970).

An Alternative to Traditional Plant Keys

A new type of plant key has been created for the computer, and is now available in our area. Over the past three years Bruce Barnes has used XID Systems software, developed by Dr. Richard Old of Pullman, WA, to create plant keys for all of the vascular plants of Oregon, Washington, Idaho, southern British Columbia, Montana, and Wyoming (Colorado and Utah will also be available soon).

To identify a plant using the computer program, the user first selects from a menu of types of plant characteristics (such as leaves, stems, inflorescences, flowers, or fruits). The user than selects those characteristics which best describe the plant to be identified. The computer eliminates from consideration all plants which do not match those characteristics, and also eliminates all menu choices which would not help to distinguish between the remaining species. The user then goes to another menu and makes another selection, and so on. At any point the user may ask the computer to analyze the remaining species and provide a list of the characteristics which are easiest to identify and will most effectively separate between the remaining species. The user may select from that list or go to a different menu. In addition, one may call up an alphabetized list of the remaining species (in either common or scientific names), including the page numbers of references (such as Dorn, Inermountain Flora, or Flora of the Great Plains) that describe the plants. When all species are eliminated but one, the plant has been identified. The user may check it against the references listed on the screen, and may check for errors by calling up a list of the characteristics that were entered.

With a little practice, identifying a plant takes one or two minutes. It usually takes only 4 or 5 entries to identify a species. This speed and simplicity is due to the computer identifying the species that has a particular combination of characteristics.

The traditional dichotomous keys that we have all struggled with are a very ingenious system, given the limitations of pen and paper with large volumes of data. They also demand great skill to create and much practice and patience to use. A frequently frustrating experience with dichotomous keys is being expected to make a choice in the key when the necessary part of the plant (such as fruit or flower) is not present. In an expert system key, the user is simply asked to describe the features that are most obvious about the plant. If a plant characteristic cannot be clearly defined, such as whether a leaf is best described as lanceolate or linear, the user may tell the computer to include all species that have either description.

The keys include comprehensive data on each species in order to provide the user with the widest possible range of characteristics from which to choose, and they contain all vascular plants known from the region (including all trees, flowering plants, grasses, and fern allies). Plant names are based primarily on the NRCS PLANTS database.

Technical botanical terms are kept to a minimum, and help screens with definitions are provided for all menu items. Graphics with line drawings to accompany the definitions are available, and are a great help in clarifying definitions. Help screens also provide a description of the habitat and geographic range for each plant.

The keys are sold by geographic areas (such as SW Wyoming). The software they run in is available for DOS, Windows, or MAC formats. For prices and ordering information, please contact Bruce Barnes at Flora ID Northwest, at 541-278-2222 (office), 541-276-5547 (home), 541-276-8405 (fax), or flora@ucinet.com or at http://www.pullman.com/Business/xid/fidnw.html. BB

Botany Briefs
Botanical News from Wyoming And the Rocky Mountain Region

Master Gardeners Meeting in Casper: The Natrona County Master Gardeners are hosting the 1998 Western Regional Master Gardeners' Convention in Casper July 15-18. The conference will include a variety of speakers and garden tours. Registration is $175.00 per person and includes all tuition, speakers, meals, and tours. For more information contact Ed Hartman (307-472-6936) or Rose-Mary King (307-577-0568).

Update on *Spiranthes diluvialis* in Western North America: The Ute Lady's tresses (*Spiranthes diluvialis*) is Wyoming's only plant species currently listed under the Endangered Species Act. This white-flowered orchid was not known to occur in Wyoming until 1993, when a small population was discovered by B. Ernie Nelson in southern Goshen County (see the May 1994 issue of *Castilleja*). In the years since Nelson's discovery, other botanists affiliated with the Rocky Mountain Herbarium, BLM, Nature Conservancy, and private contracting firms have scoured the eastern plains, Green River Basin, and Jackson Hole area for additional *Spiranthes* populations. As a result, this species is now known from 4 locations in the state, including new sites discovered by Ernie Nelson in Converse County and Don Hazlett in Laramie and Niobrara counties.

More importantly, *Spiranthes diluvialis* is now beginning to show up in additional states. Since 1994, at least seven new populations have been discovered in Nebraska, Montana, Idaho, and Washington, greatly expanding the known range of the species. Although the new populations are mostly small and widely scattered, these discoveries indicate that the species is more abundant and widespread than was originally suspected when it was listed as Threatened in 1992. Rangewide, Ute ladies tresses is now known from 25-30 occurrences and an estimated 25,000 individuals. Some concerns still exist about the species' survival, however, especially in areas where its wet meadow habitat is threatened by urban sprawl and development. WF

Botanical Accuracy in Hollywood

By John "2 Thumbs Down" Baxter

Four examples of the inaccurate treatment of botany in the movies and TV:

1. In the original "Frankenstein", after the monster has deep-sixed the little girl in the lake, he (it?) goes staggering through a grove of *Eucalyptus* trees (very common in Central Europe).

2. In "Sands of Iwo Jima" John Wayne and his fellow marines go storming ashore through a grove of palm trees. Are there palms on Iwo Jima? I doubt it. I don't think even saltgrass and Russian thistle would grow in volcanic sand.

3. "Battle of the Bulge". This actually took place in Belgium. In the climactic tank battle, Telly Savalas is tooling around in the Mohave Desert (lots of *Larrea* in the area).

4. ABC's "The Thorn Birds". I watched the first part. The Drogheda sheep station is obviously in the rolling hills of California. All those oaks – not a gum tree anywhere. Occasionally, in front of the camera, you see a tired kangaroo from the San Diego Zoo. This is Australia?

The Wyoming Native Plant Society, established in 1981, is a non-profit organization dedicated to encouraging the appreciation and conservation of the native flora and plant communities of Wyoming. The Society promotes education and research on native plants of the state through its newsletter, field trips, and annual student scholarship award. Membership is open to individuals, families, or organizations with an interest in Wyoming's flora. Members receive *Castilleja*, the Society's quarterly newsletter, and may take part in all of the Society's programs and projects, including the annual meeting/field trip held each summer. Dues are $5 annually.

To join the Wyoming Native Plant Society, return the membership form below to:

Wyoming Native Plant Society
1604 Grand Ave.
Laramie, WY 82070

Wyoming Native Plant Society

Name: _____

Address: _____

_____

___ $5.00 Regular Membership

___ $15.00 Scholarship Supporting Member
($10.00 goes to the annual scholarship fund)

Wyoming Native Plant Society

WYOMING NATIVE
PLANT SOCIETY
1604 Grand Avenue
Laramie, WY 82070